VAISALA

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Vaisala HUMICAP Humidity and Temperature HMT140 Wi-Fi Data Logger

M211488EN-E

Contents

CHAPTER 1

GENERAL INFORMATION

Thank you for choosing the Vaisala HMT140 Wi-Fi Data Logger .

About this Manual

This manual provides information for installing, operating, and maintaining the Vaisala HMT140 Wi-Fi Data Logger. It also details the operation of the HMT140 Utility software.

Contents of this Manual

- **Chapter 1: General Information**, provides safety and regulatory information for the HMT140 series of Wi-Fi data loggers.
- **Chapter 2: Product Overview**, provides information about the HMT140 features, models and accessories.
- **Chapter 3: Installation**, describes how to mount the HMT140 to a wall or duct, and illustrates different wiring options.
- **Chapter 4: Setup and Operation**, contains the information you need to install and connect an HMT140 to your network using the HMT140 Utility software and an HMT140 Configuration Cable, and instructions on how to operate the HMT140.
- **Chapter 5: Maintenance**, provides information required for basic maintenance of the product.
- **Appendix: Specifications and Troubleshooting**, provides additional technical data.

Related Documentation and Software

For help setting up the HMT140 with basic configuration requirements, consult the HMT140 Quick Guide.

For help configuring the HMT140 with Vaisala Veriteq viewLinc, consult the Vaisala Veriteq viewLinc User's Guide.

Getting Help

North America

Contact Vaisala, 8am - 4pm PST Monday to Friday
Phone: 1-888-VAISALA
Email: helpdesk@vaisala.com.

Web: www.vaisala.com/en/lifescience.

For assistance calibrating Devices, contact the Vaisala
Calibration Service Center (http://www.vaisala.com/calibration)

Vaisala Headquarters (Finland)

Vanha Nurmijärventie 21
01670 Vantaa
FINLAND
Industrial Instruments
Phone: +358 9 8949 2658
Fax: +358 9 8949 2295

Japan Service Center

42 Kagurazaka 6-Chome
Shinjuku-ku
Tokyo 162-0825
JAPAN
Phone: +81 3 3266 9611
Fax: +81 3 3266 9610

China Service Center

Floor 2, EAS Building
No. 21, Xiao Yun Road, Dongsanhuan Beilu
Chaoyang District
Beijing 100027
CHINA
Phone: +86 10 5827 4100
Fax: +86 10 8526 1155

Safety

The Vaisala HMT140 Wi-Fi Data Logger delivered to you has been tested for safety and approved as shipped from the factory.

Do not modify the unit. Improper modification can damage the product or lead to malfunction.

Batteries

⚠ Remove batteries before shipping.

ESD Protection

Electrostatic Discharge (ESD) can cause immediate or latent damage to electronic circuits. Vaisala products are adequately protected against ESD for their intended use. However, it is possible to damage the product by delivering electrostatic discharges when touching, removing or inserting any objects inside the equipment housing.

To make sure you are not delivering high static voltages:

• Handle ESD sensitive components on a properly grounded and protected ESD workbench.

• When this is not possible, ground yourself to the equipment chassis before touching the boards, or ground yourself with a wrist strap and a resistive connection cord.

• When neither of the above is possible, touch a conductive part of the equipment chassis with your other hand before touching the boards.

• Always hold the boards by the edges and avoid touching the component contacts.

Recycling

Recycle all applicable material. Dispose of batteries and the unit according to statutory regulations. Do not dispose with regular household refuse.

License Agreement

All rights to any software are held by Vaisala or third parties. the customer is allowed to use the software only to the extent that is provided by the applicable supply contract or Software License Agreement.

Warranty

Visit our Internet pages for information about our standard warranty terms and conditions: http://www.vaisala.com/en/services/maintenance/Pages/warranty.aspx.

Please observe that any such warranty may not be valid in case of damage due to normal wear and tear, exceptional operating conditions, negligent handling or installation, or unauthorized modifications. Please see the applicable supply contract or Conditions of Sale for details of the warranty for each product.

Regulatory Compliances

The Vaisala HMT140 Wi-Fi Data Logger is in conformity with the provisions of the following directives/standards:

- FCC: U30-G2M5477 (FCC Part 15 SubpartB: 2008 Class B, FCC CRF Title 47 Part 15 Subpart C)
- IC: 8169A-G2M5477 (IC RSS-210)
- CE: EU ID # 0681 (ETSI EN301 489-1 V1.8.1, 489-17 V2.1.1, ETSI EN300 328 V1.7.1, EN55022 Class B, EN61000 4-2, 4-3, 4-6, 4-8, EN60950-1:2001+A11:2004)
- CAN ICES-3(B)/NMB-3(B)
- Wi-Fi Certified: WFA7649
- FCC 47 CRF Part 15-2011 Subpart B
- IC ICES-003:2004
- EN61326-1:2006
- EN61326-2-3:2006
- EN61000-3-2:2006+A1:2009+A2:2009
- EN61000-3-3:2008
- EN61326-1:2006

- MIC R 201-125765
- CMIIT ID: 2013DJ7129

CE N17728 FC

R 201-125765
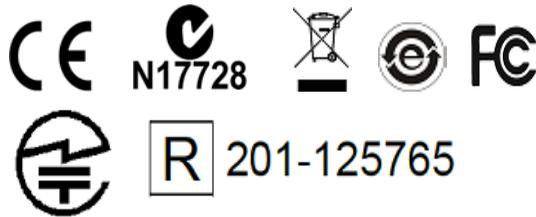
HMT140 Configuration Cable

The HMT140 Configuration Cable complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Regulatory Compliances

CHAPTER 2

PRODUCT OVERVIEW

The Vaisala range of relative humidity measurement instruments covers all the applications from ventilation to process control in demanding conditions. For more information about other Vaisala relative humidity instruments, please contact your Vaisala representative or visit www.vaisala.com.

This chapter provides general information about the HMT140, including:

- Features
- Models
- Options and accessories
- HMT140 components

Introduction to the HMT140

The Vaisala HMT140 Wi-Fi Data Logger measures relative humidity and temperature using the connected probe and analog signals – RTD, Voltage, Current Loops and Boolean Contacts. It is powered with three 3.6 volt DC batteries (or an optional 9-30VDC power supply), outputs data via wireless transmission, and comes with or without an optional LCD display.

The HMT140 supports several different signal measurements (channels), which are monitored in viewLinc:

- Relative Humidity (RH)
- Temperature (T)
- Switch Contact
- Voltage and Current.

Channel types are set at the factory during time of order. Other wireless parameters can be changed at a later date using an HMT140 Configuration Cable and HMT140 Utility software.

Models

The following HMT140 models and options are available:

- **HMT141:** Vaisala Humicap Humidity and Temp Probe (RH/T)
- **HMT143:** Dual RTD Temperature Inputs w/5M Probes (-90C to 90C)
- **HMT144:** Voltage Inputs (0-5 VDC)
- **HMT145:** Voltage inputs (0-10 VDC)
- **HMT146:** Current Inputs (0-20 mA)
- **HMT147:** Boolean Inputs
- **HMT148:** RTD Temperature Input w/5M Probe & Boolean Input
- **HMT14C:** RTD Inputs (customer-supplied Probe)
- **HMT14D:** RTD and Current Inputs
- **HMT14E:** RTD and Voltage Inputs (0-5 VDC)
- **HMT14F:** RTD and Voltage Inputs (0-10 VDC)

Options and Accessories

Humidity & temperature probe HMP110D*

Humidity & temperature replacement probe HMP110R*

Humidity sensor HUMICAP180R

HMP110D Probe mounting flange 226061

HMP110D Probe mounting clamps, 10 pcs 226067

HMP110D Probe cable 3 m HMT140Z300

HMP110D Probe cable 5 mHMT140Z500

HMP110D Probe cable 10 m HMT140Z1000

Duct installation kit215619

Probe mounting flange226061

Boolean Switch Kit with Door Contact236319

Thermal Dampener Blocks236310SP

Replacement Batteries (Pack of 3)236318SP

External Power Supply 236081SP

HMP110D sensor protection:

  Plastic grid filter DRW010522SP

  Plastic grid with membrane filter DRW010525

  Stainless steel sintered filter HM46670SP

*Separate order form required. Contact Vaisala sales at: http://www.vaisala.com/en/contact/sales/Pages/ default.aspx

Fixed or Remote Probe

The HMT140 is available either with a fixed probe directly attached to the housing or a remote probe with different (3/ 5/10 m) cable lengths. Extension cables can be easily cascaded in order to obtain longer reach, to a maximum length of 10 m.

Interchangeable Probe

The HMP110D HUMICAP® relative humidity probe used in the HMT140 is fully interchangeable. You can easily remove the probe and replace it with a new one without having to

adjust the HMT140. You have the following options when purchasing a new probe from Vaisala:

- Order a new probe and keep your current one.
- Order a new probe and return the old one to Vaisala (replacement probe).

Note: Only probes that have a compatible digital output (VDIGI mode) can be used with the HMT140. Compatible probes have the letter "V" as the first letter in their order code. The order code is written on the probe.

Optional Display

The HMT140 is also available with an optional graphical 128x64 pixel resolution LCD display. The display shows the measurement results of selected parameters in selected units (defined at the time of ordering). The parameters are displayed simultaneously as two separate rows on the display.

HMT140 Components

Figure 1 illustrates the main features of the HMT140. On the left is a remote probe model without display, and on the right is a fixed probe model with the optional display. The numbers and arrows indicate the main components of the HMT140 models.
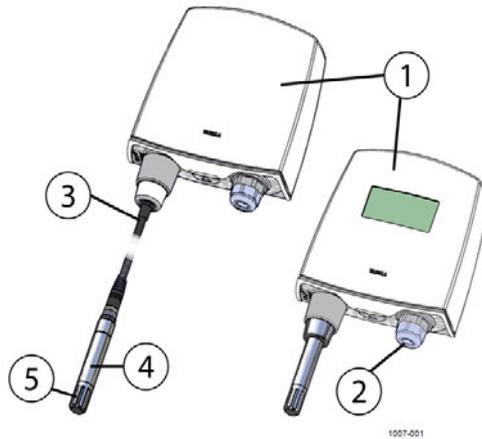
Figure 1: HMT140 Features

The following numbers refer to Figure 1:

1 HMT140 enclosure

2 Cable bushing: cable gland.

3 Probe cable

4 HMP110D probe

5 Plastic grid filter

Installation Kit

The HMT140 is typically installed mounted on the wall with up to four screws (not included). See Figure 2 on page 15.

For duct mounting, Duct Installation Kits are available as accessories. See Options and Accessories, on page 9.

To help you position the screws correctly, use the Drilling Template, available inside the back cover of the Quick Guide.

HMT140 Utility and Configuration Cable

To connect an HMT140 to your network, you will need to install the HMT140 Utility software and connect the HMT140 to your PC with the configuration cable (see, Connecting to your Network, on page 24).

INSTALLATION

This chapter provides the information you need to:

- Mount the HMT140 on a wall or duct
- Connect the HMT140 to your network
- Review optional mounting accessories

Mounting

Depending on your installation requirements, you may wish to complete the network configuration and setup prior to mounting (see, Chapter 4 Setup and Operation). Note that you can complete the configuration and setup procedures after mounting with a portable PC.

Note: To connect the HMT140 to your network and view HMT140 data using viewLinc, you require HMT140 Utility software and an HMT140 Configuration Cable (shipped with viewLinc).

Wall Mounting

To mount the HMT140 on a wall:

Note: If mounting against a metal surface, be sure to keep a minimum of 2 mm between the metal and the back of the HMT140 to ensure an uninterrupted radio signal.

1   Open the HMT140 cover. Use your thumb to press and hold the release tab located between the two glands (see Figure 9 on page 19), then pull the cover out and up with your other hand.

2   Make sure that the HMT140 is correctly aligned and attach it directly to the wall with up to four screws (not included in the package).

  • Select the size and type of the fastening screws according to the wall material (for example, wood or stone). The diameter of the fastening screws is typically between 3.5 and 4 mm.
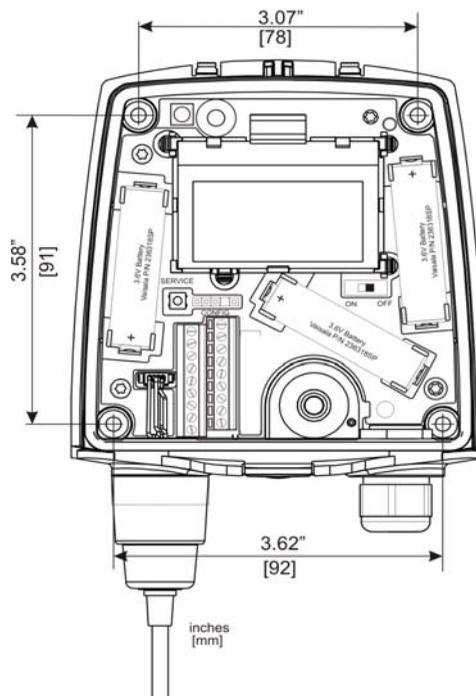
Figure 2: Mounting Diagram

> **Note:** It is strongly recommended that you use all four screws; however, the HMT140 enclosure fastening holes are initially covered with a thin plastic membrane, so less than four screws could be also be used without sacrificing the ingress protection (IP) class of the enclosure.

Duct Installation

The duct installation kit includes a plastic pipe with a flange (Vaisala part#: 215619).

To install the HMP110D probe with the duct installation kit, drill a hole into the duct wall, assemble the probe to the duct installation kit, slide the probe head through the hole, and attach the flange to the duct wall with four screws.

See "Probe Assembly with Duct Installation Kit" on page 16 for details.
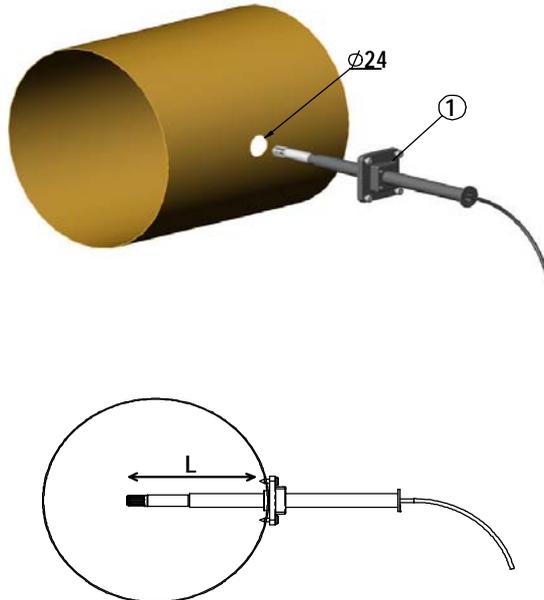
Figure 3: Probe Installation

The following numbers refer to Figure 3:

1 Tension screw

Distance L can be adjusted and locked in place with the tension screw.

Probe Assembly with Duct Installation Kit
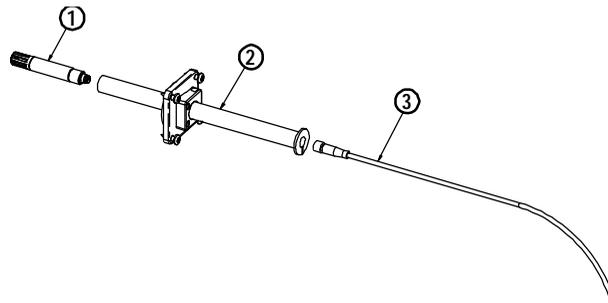
Figure 4: Probe Assembly with Duct Installation Kit

The following numbers refer to Figure 4:

1 Probe (HMP110D)

2 Duct installation kit

3 Probe cable

To assemble the probe:

1 Pass the probe cable through the plastic pipe of the duct installation kit.

2 Connect the probe cable to the HMP110D.
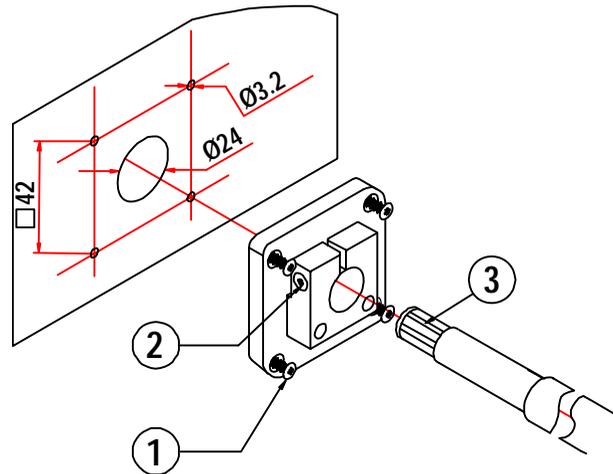
Figure 5: Drilling Instructions

The following numbers refer to Figure 5:

1 Mounting screw

2 Tension screw

3 HMP110D assembled in duct installation kit plastic pipe

To attach the probe assembly to the duct:

1 Drill the holes for the duct installation kit as follows:

- Use a 24-mm drill bit to drill a hole in the wall.
- Use a 3.2-mm drill bit to make four holes for the installation screws (four ST4.2×16-C-Z DIN 7981 screws). The holes should be arranged in a square around the 24 mm hole, at a distance of 42 mm from each other.

2 Mount the probe holder using the screws.

3 Adjust the depth of the plastic pipe and tighten the screw to lock the probe in place.

Figure 6: Drilling specifications

Optional Mounting Accessories

Probe Mounting Flange

The probe mounting flange (Vaisala order code: 226061) is a general purpose mounting flange for 12 mm diameter probes. It can be used to hold the HMP110D probe in a through-wall installation.

Note: The coaxial silicone plug that is delivered with the flange is not suitable for use with the probe cable of the HMT140.

Figure 7: Optional Probe Mounting Flange

Probe Mounting Clamp

The optional mounting clamp (Vaisala part #: 226067) makes it easy to install the probe on the wall of the measurement environment. The probe can be detached for calibration simply by loosening the lower screw.

Installing the entire probe in the measurement environment prevents heat conduction to the sensor, and is the recommended installation method.

Figure 8: Optional Probe Mounting Clamp

> **CAUTION:** Attaching the probe mounting clamp to a conductive wall material should be avoided, since the potential galvanic connection to the power supplies and uncontrolled earth current loops could cause measurement errors or even damage to an HMT140 (not the HMT141).

Wiring Diagrams

The following figures outline the components, wiring and connections of the HMT140.
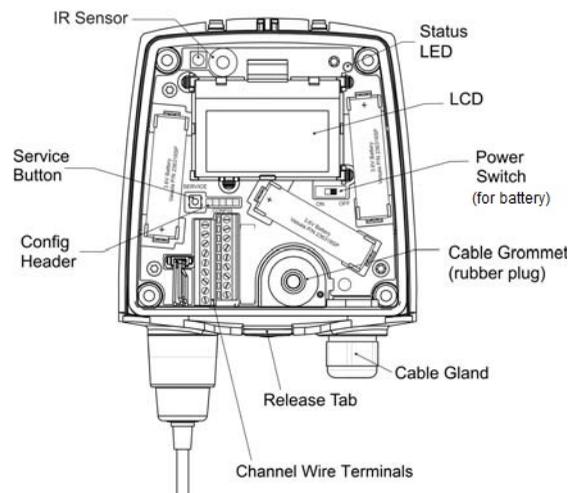
Figure 9: HMT140 Components Diagram
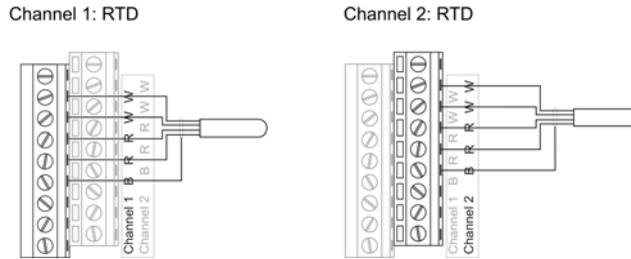
Figure 10: RTD Wiring Diagram
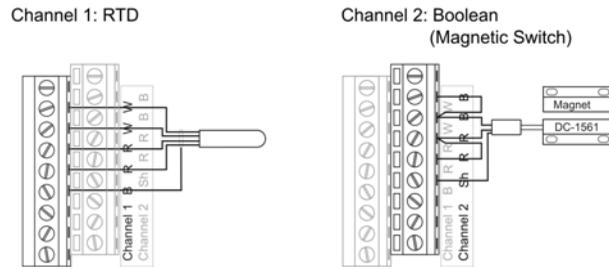
Figure 11: RTD and Boolean Wiring Diagram
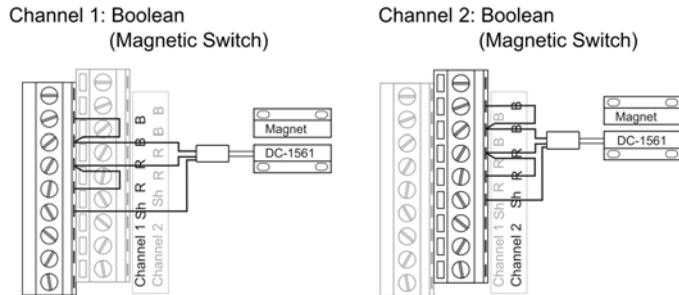
Figure 12: Boolean Wiring Diagram
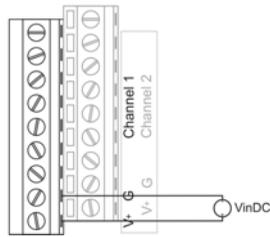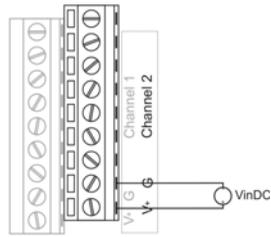
Figure 13: Voltage Wiring Diagram

Figure 14: Current Wiring Diagram
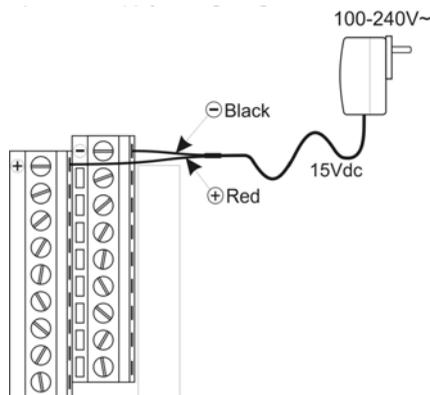
Figure 15: Power Supply Wiring Diagram

CHAPTER 4
SETUP AND OPERATION

This chapter will guide you during the setup of your HMT140 with your network parameters. Here you will find the information you need to:

- Configure the HMT140
- Operate the HMT140
- Customize the HMT140 for your network

Connecting to your Network

The HMT140 Configuration Cable allows you to connect an HMT140 to your PC. You can then configure the HMT140 with your network settings using the HMT140 Utility software (software and cable shipped with viewLinc).

Install the HMT140 Utility Software

The HMT140 Utility software configures and reads the settings in the HMT140 that use 802.11b and 80211g wireless networks. The address of the destination host, the wireless network parameters, transmit period, and other important network functions of the HMT140 are specified using the HMT140 Utility. The HMT140 Utility also provides you with access to tools for diagnosing connection problems.

Before you configure the HMT140, the HMT140 Utility software must be installed on the PC. The driver is compatible with Windows 2000, Windows XP, Windows 7, and Windows Server 2003.

To install the HMT140 Utility:

1   Disconnect the HMT140 Configuration Cable if it is already connected to your PC.
2   Insert the CD that came with the HMT140 Configuration Cable, or download the software from www.vaisala.com.
3   Run the HMT140 Utility installation program (HMT140UtilitySetup.exe).
4   Accept the license agreement terms, then click **Next** to accept the installation default settings. The installation of the driver may take several minutes.
5   After the software is installed, connect the HMT140 Configuration Cable to a USB port on your PC to complete the installation. You are now ready to set up and configure your HMT140.

If you wish to remove the HMT140 Utility software at a later date, use the uninstall function on your Windows Control Panel.

Set up the HMT140

Once the HMT140 Utility software is successfully installed, you can set up your data monitoring device.

To set up the HMT140 for the first time:

1   Ensure the HMT140 configuration Cable is not connected to the PC.

2   Open the HMT140 case. Use your thumb to press and hold the release tab located between the two glands (see Figure 9 on page 19), then pull the cover out and up with your other hand. Pry the case open with a slot screwdriver if you are unable to open the case by hand.

3   Ensure the power switch on the HMT140 is in the OFF position.

   Note: The ON/OFF switch only applies to battery power.

4   Install three lithium batteries (use only Vaisala 3.6V Lithium Thionyl Chloride batteries, part#: 236318SP).

5   Ensure that the HMT140 Configuration Cable is not connected to the HMT140.

6   Turn the power switch on the HMT140 to the ON position, and wait for the setup process to complete (about five seconds). LED light turns on, then off.

Configure the HMT140 to your Network

After you install the HMT140 Utility software and set up the HMT140, use the HMT140 Configuration Cable to connect and configure the HMT140 to your network.

   Important: Do not connect the Configuration Cable to the HMT140 configuration port unless the Configuration Cable is connected to a computer USB port, the batteries are installed, and the power switch is in the ON position.

The following steps provide you with standard network settings. You can also set specific settings depending on your network configuration. See "Custom Settings" on page 28.

To configure the HMT140 for your network with standard settings:

1   Ensure the HMT140 case is open and the correct batteries are installed (Vaisala part#: 236318S).

2   Turn on the HMT140 and wait five seconds to ensure the startup process completes.

3   Plug the USB connector on the HMT140 Configuration Cable to the computer, if it is not already connected.

4   From the start menu, open the HMT140 Utility.

5   Connect the end of the Configuration Cable labelled **USB Wi-Fi Programmer,** to the 4-pin HMT140 CONFIG header.

6   On the HMT140 **Setup** tab, click **Retrieve** to identify the HMT140. The bottom left status bar will initially read, **Looking for sensor or USB programmer**, then, once the HMT140 is identified, the status bar will read, **Found USB Programmer.**

7   Click **Retrieve** again to force retrieval of current settings.

> **Note:**   The connected type is identified in the upper right corner of the Setup tab window.
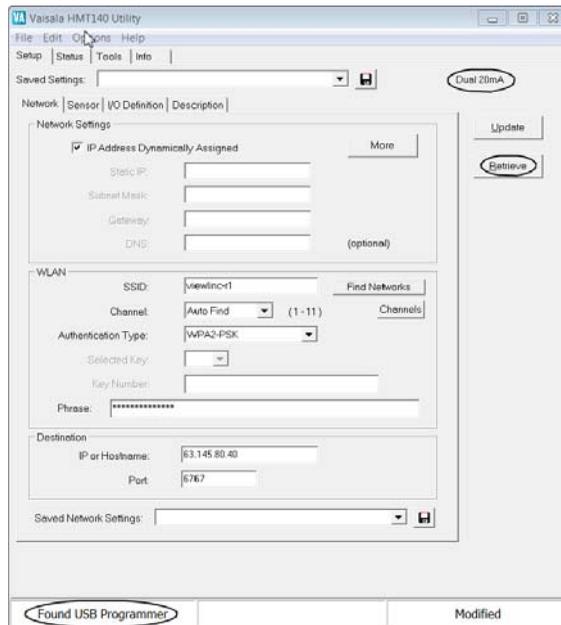
The status bar is located at the bottom of the HMT140 Utility window. It contains the following panels:

- **Left panel:** Displays the Configuration Cable status: Found USB Programmer or Looking for USB Programmer.
- **Middle panel:** Displays progress messages of the different actions: Update, Retrieve, Status, and Info.
- **Right panel:** Displays a message when the parameters on the Setup page have been modified and require saving.

8   If the IP address is static, uncheck the **IP Address Dynamically Assigned** option and enter the network parameters. Otherwise leave this checkbox checked.

   Note: For additional IP address settings information see, Check Transmission status on page 31.

9   Enter the parameters for the **WLAN** (wireless LAN router settings).

10   Enter the **Destination** IP address/name and port number of the host (these are the Vaisala viewLinc server settings) to which the HMT140 will send information.

   Note: If you do not know what information to enter for steps 6-9, please request these parameters from your network administrator.

11   Click the **Sensor** tab and select a **Transmit Period Time** and number of **Tries**, or accept the default settings.

12   Click **Update**.

13   Click the **Status** tab to check that the settings appear as configured. Click **Get** if the settings do not appear automatically.

14   Disconnect the HMT140 Configuration Cable from the HMT140 and wait for eight seconds.

15   Press the SERVICE button inside the HMT140.

   Optional: Enter a name for the saved settings on the **Setup** tab in the **Saved Settings** field, then click the disk icon to save. To configure custom settings for the HMT140, refer to page 28. To configure additional HMT140 data loggers, refer to the Vaisala viewLinc User's Guide.

Setup Consideration

If DHCP or DNS is being used, it is best to use local DHCP and DNS servers rather than a DNS server on the internet. The local servers will give better response times compared to the remote servers and, as a result, help to conserve battery life.

Custom Settings

Use the HMT140 Utility to make additional changes to an HMT140 data logger's network configuration settings.

Modify Transmission Settings

To modify transmission settings:

1   Ensure the HMT140 case is open and the correct batteries are installed. (Vaisala part#: 236318SP).
2   Turn on the HMT140 and wait five seconds to ensure the startup process completes.
3   Plug the USB connector on the HMT140 Configuration Cable to the computer, if it is not already connected.
4   From the **Start** menu, open the HMT140 Utility.
5   Connect the end of the HMT140 Configuration Cable labelled **USB Wi-Fi Programmer**, to the 4-pin HMT140 CONFIG header.
6   On the HMT140 Utility **Setup** tab, click **Retrieve** to identify the HMT140.
7   On the **Sensor** tab, select from the following options:
    Transmit Period: Select how frequently the HMT140 transmits data.

    Tries: Select the number of transmission attempts permitted for the specified Transmit Period.

    Note: An active alarm overrides a specified Transmit Period.
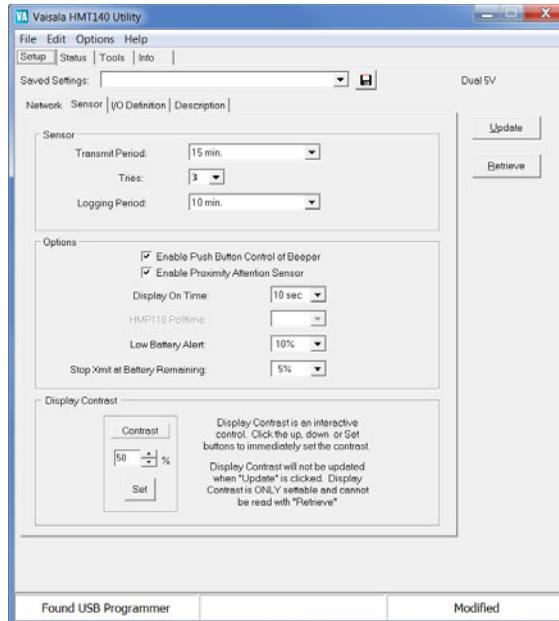
For example, if you select 15 minutes for the Transmit Period, and 3 for the number of Tries, the HMT140 will attempt to transmit every 15 minutes. If it cannot transmit, it will make 3 transmission attempts, then will go into 'sleep' mode until the next scheduled transmit period.

Logging Period: Specify how often the HMT140 will log I/O into the log buffer.

Note: When setting up a new HMT140, you can click **Retrieve**, to view current settings.

Enable Beeper: Select the option to enable or disable the button control of the Beeper (whether you want to be able to turn the Beeper on or off with the push button on the HMT140). It is also possible to turn the Beeper on and off by holding down the SERVICE button for approximately five seconds.

Note: The Beeper is enabled by default. There is no external Beeper status indicator. It must be enabled/disabled with the SERVICE button.

Enable Proximity Attention Sensor: Select this option to enable or disable the proximity attention sensor. The sensor is used to wake up the HMT140 and to cause the HMT140 to send a data packet to the host.

Display On Time: Select the length of time the display stays on when the HMT140 is solely battery-powered (choose a minimum length of time to save battery power).

HMP110D Polltime: If your HMT140 uses an HMP110D Probe, select how frequently the HMT140 polls the HMP110D probe (leave at the default setting, two minutes).

Low Battery Alert: Specify at what percentage of battery life remaining you want the Low Battery indicator to display and notify the host software. For more information see, Viewing Battery Life Remaining on page 37.

Stop Xmit at Battery Remaining: Specify at what percentage of battery life remaining you want the HMT140 to stop transmitting data to the host (to save battery power). Once this threshold is reached, the HMT140 functions normally except it will not transmit data using the Wi-Fi radio.

8   Use the **Display Contrast** interactive control to set the HMT140 display contrast. When the **Up**, **Down** or **Set** buttons are clicked, the HMT140 Utility will attempt to set the contrast.

   Note: The contrast value can only be set when you click Set. The value is not set with the Update or Retrieve buttons.

9   Click **Update**. The HMT140 Utility will send these settings to the HMT140 and then reboot. After the settings are successfully configured, a dialog displays **Configured!** If there was an error sending the settings, the HMT140 Utility will display the error in a popup dialog window. The center panel in the bottom status bar will display the update status.

10 Select the **Status** tab to check that the settings appear as configured. Click **Get** if they do not appear automatically.

11 Disconnect the HMT140 Configuration Cable from the HMT140 and wait eight seconds.

12 Press the SERVICE button on the HMT140.
Optional: Enter a name for the saved settings on the **Set up** tab in the **Saved Settings** field and click the disk icon to save. If the HMT140 is used with more than one wireless network, enter a name in the **Saved Network Settings** field and click **Save**. Other network settings files can be saved and recalled from the Saved Settings field.

Modify HMT140 Description

If you want to make it easier to identify specific HMT140 data loggers, enter custom names. By default, each HMT140 is identified using the model name and channel type.

> **Note:** Check with your network administrator before making changes.

To modify your HMT140 name and Channel descriptions:

1 Complete steps 1 to 6 in the procedure, Modify Transmission Settings, on page 28.

2 Select the Description tab and enter a name, and/or Channel descriptions. You can view these descriptions in viewLinc, and make changes in viewLinc if required.

Check Transmission status

The Status page displays the current state of the IP settings, connection status, signal strength, and battery life parameters, as applied using the Update button on the Network tab.

To monitor the transmission status:

1 On the **Status** tab, click **Get** to update the HMT140 Utility window with the latest status information: IP settings, WLAN and Sensor battery. If successful, the HMT140 Utility displays the information on the **Status** page.
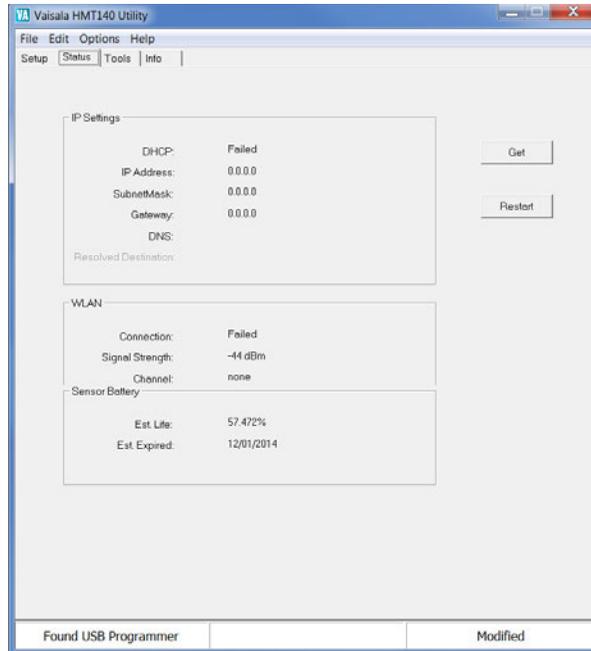
2 Read IP Settings status:
DHCP:

- **Off** – static IP address information is being used
- **On** – IP settings are successfully assigned
- **Cache** – IP settings are successfully assigned and the HMT140 will cache this IP address
- **Failed** – the HMT140 could not obtain the IP settings.

IP Address: Current IP address. If "0.0.0.0", then no IP address has been assigned.

Subnet Mask: Current assigned subnet mask.

Gateway: Current assigned gateway address.

DNS: Current assigned Name Server address.

Resolved Destination: Appears if the hostname is given for the Destination.

3 Read WLAN status:
Connection:

- **Failed**: The HMT140 has failed to connect to a wireless network.
- **Associated** - **Not Connected**: The HMT140 has associated with the network but has not connected.
- **Authenticated** - **Not Connected**: Security settings have been authenticated but has not connected.
- **Assoc/Authen** - **Connected**: The HMT140 has associated and authenticated to the network and connected successfully to the network.

Signal Strength: Signal strength of the last communications. The signal strength can vary from reading to reading. Multiple samples should be taken to determine the signal strength.

Channel: This is the channel found during the Channel Auto Find feature or the channel set in the Setup page. If the HMT140 cannot find a channel when in Auto Find mode, the utility will display "none".

4 Check HMT140 battery status:

Est. Life: Estimated percentage remaining of the battery.

Est. Expired: Estimated date when the battery should be changed (dependant on the Transmit Period and the number of alarms). For more information see, Viewing Battery Life Remaining on page 37.

HMT140 Function Modes

Operating Modes

The HMT140 operates in two modes: Config mode and Transmitter mode.

Config Mode

When the HMT140 is powered on, and the HMT140 Configuration Cable is connected to it, the HMT140 connects to the network for about two seconds and then goes to sleep.

When new activity occurs, the HMT140 will wake again, connect, then go back to sleep after five seconds.

Transmitter Mode

When the HMT140 is powered on and the HMT140 Configuration Cable is not plugged into it, data is transmitted according to the transmit settings.

In Transmitter mode, the HMT140 spends most of its time in a very low power state (sleep). When a transmit period is due, it powers up the radio, attempts to link to the specified wireless network, transmits its data and then goes back to sleep. The HMT140 transmits based on the configured transmit period or when it is entering an alarm state.

Transmission of Data

The HMT140 will go through the following steps in order to connect to a network and deliver data:

1 Associates with the network.
2 HMT140 authenticated by the network (depends on the type of security).
3 Requests IP from DHCP Server (if set to dynamic IP)
4 HMT140 receives request from Name Server IP address of hostname (if a hostname is used for the Destination address and DNS Server specified).
5 Sends data.
6 viewLinc returns acknowledgement.

Transmit Attempts

The HMT140 will initiate a Transmit Attempt repeatedly (typically every 30 seconds) until either an acknowledgement is received from the host, or the number of tries has been exhausted. It follows this transmission mechanism both when the transmit period arrives and for alarm attempts.

Alarm-triggered Transmission

The HMT140 has the ability to initiate a Transmit Attempt based on an alarm, if this functionality is configured in viewLinc.

An alarm can be triggered either when the measured value exceeds a high threshold or goes below a low threshold for a period of time, as configured in viewLinc.

The HMT140 can also be configured to initiate a Transmit Attempt when it exits an alarm state. Refer to the Vaisala Veriteq viewLinc User's Guide for information about alarm settings.

Additional Settings

Change Input/Output Scale

If you want your HMT140 to provide more meaningful output measurement units, you can modify the output settings (if you are not sure if your network requires/ supports this option, contact Vaisala Technical Support for assistance).

To modify input/output values:

1   From the **Setup** tab, select the **I/O Definition** tab.

2   Enter the HMT140's input range values.
3   Enter required **Display Units**, the number of decimal places you want recorded, the high/low output values and desired measurement units.

Save and Recall Settings

Your setup parameters can be saved and associated with a name on the **Setup** tab, in the **Saved Settings** field. These setup parameters can then be recalled by that name, saving you time reentering the settings.

The network parameters can also be saved separately and associated with a name on the **Network** tab, in the **Saved Network Settings** field. The network setup parameters can then be recalled by that name.

Delete Saved Settings

Both the Saved Settings and the Saved Network Settings can be deleted, to help keep the list of saved settings easier to view and/or manage.

▸ On the **File** menu, select **Delete Sensor Setup** or **Delete Network Setup**, then choose the correct settings name to delete.

Restart the HMT140

You may want to reboot your HMT140 to reconnect to the network and re-acquire status information.

▸ On the **Status** tab, click **Restart.**

Get General Information

To gather general information about the HMT140, select the **Info** tab and then click **Get**. The HMT140 Utility will retrieve the following information:

- MAC address
- Firmware version
- HMT140 serial number
- HMP110D serial number (if using)

Battery Usage

The HMT140 has a built-in battery meter. This meter is based on a count of its transmissions. To determine battery life remaining, the meter records the amount of power used during transmission relative to the power remaining.

Viewing Battery Life Remaining

The HMT140 Utility displays the estimated battery expiration and the estimated battery life percentages on the **Status** page.

> Note: The shorter the transmit period, the shorter the battery life.

> CAUTION: When replacing batteries, the meter must be reset to recognize the new battery status.

To view battery life remaining:

▸ On the **Status** tab, view the batter meter status in the **Est. Life** field.

To reset the battery meter after installing new batteries:

> Note: To install new batteries, see Battery Replacement on page 48.

1 Turn off the HMT140. Make sure the configuration Cable is disconnected.

2 Press and hold the SERVICE button.
- Turn the HMT140 on while the SERVICE button is engaged.
- Wait four seconds. You will hear eight beeps from the beeper.

3 Release the SERVICE button to complete the battery meter reset.

4 Confirm that the battery meter is reset. Reconnect the Configuration Cable to the HMT140 and view the estimated battery life in the **Status** tab (it should indicate 100%).

Units and Temperature

Use the **Options** menu to set the measurement units you want to display on screen.

To change display units:

‣ On the **Options** tab, select **Units.**

Connection Performance

Consistent connection performance is essential for longevity of battery life. The HMT140 Utility can perform a test to indicate how well the HMT140 connects to the network, which provides an indication about the expected battery life. To perform the test, see page 43.

> **Note:** If the average connection time is more than five seconds, the HMT140 may not connect consistently and the battery may be exhausted before the battery meter indicates.

Connect Times

The following are the components of the connect time:

Description	Option	802.11 b (sec)	802.11g (sec) Cache/ Noncache
HMT140 Startup	No	2	0.1
Auto Find Channel	Yes	1	0.1
Associate/ Authentication	No	< 1	< 1
DHCP lookup	Yes	< 1	< 1
DNS lookup	Yes	< 1	< 1

Determining Connection Problems

In some networks, one of the optional components of the connect time may take too long to perform on a consistent

basis. If the average connection time is too long it is important to try isolate the cause.

To isolate a connection problem:

1   Open the HMT140 Utility and connect the Configuration Cable to the HMT140 and your PC.

2   Temporarily turn off one of the connection options and then measure the average connection time:

   • Try setting the dynamically assigned IP address as the static address temporarily, or,

   • Try using a Destination IP address instead of the hostname address temporarily.

3   Select the **Tools** tab. In the **Test Connect Time** area, click **Start.** The HMT140 Utility will repeatedly attempt to connect to the network with one second between connection attempts. You can then view:

   • Number of connection attempts.

   • Last connect time.

   • Average, minimum and maximum connect times.

   • History of connect attempts displayed as a bar graph (each bar graph is the number of seconds for the attempt).

   • Failed connection attempts displayed as a grey bar. Failed connection attempts are not factored in the statistics.

4   To change the Connect Window time, on the **Options** menu select **Advanced Options**, and then select the desired **Connect Window** time.

Advanced Options

These advanced parameters (**Options** > **Advanced Options**) are applied each time an Update function is performed. These parameters may have an impact on transmission performance.

> **Extended Transmit Period:** Adds 30 sec., 1 min., and 2 min. as additional options for the Transmit Period in the Sensor tab.

Important: These additional periods are meant to be used for testing, evaluation and demonstration of the HMT140 and, if used, can have a severe impact on battery life.

Log Conversations: When this option is selected, the HMT140 Utility will capture the conversation between the utility and the HMT140 and place it in a file called OutputLog.txt. To locate the file, go to the **Help** menu, select **Utility Folder Paths**, and then **Explore Data**.

DHCP Caching: When this option is selected, the HMT140 will cache its IP address assigned from the DHCP server until the DHCP lease time has expired or the HMT140 is power-cycled. If not selected, the HMT140 will request an IP address each time it attempts to contact the host.

ARP Caching: When this option is selected, the HMT140 will store and keep a list of IP/MAC relationships. If not selected, the HMT140 will rebuild the IP/MAC relationships with every attempt to contact the host.

DNS Caching: When this option is selected, the HMT140 will cache the IP address that results from the DNS lookup of the Destination hostname. The HMT140 will keep the destination IP address until either the DHCP lease time expires or the HMT140 is power-cycled. If not selected, the HMT140 will request a DNS lookup of the Destination hostname each time it attempts to contact the host.

Connect Window: Set the amount of time in seconds (three to eight seconds) that the HMT140 will attempt to associate and authenticate to an access point or a wireless router (this includes the time to obtain an IP address from a DHCP server). The default rate is 5 seconds.

Data Rate: The default data rate is 1 Mbit/sec. and can be set from one to 54 Mbit/sec. The lower the data rate the longer range the HMT140 will have. The 802.11b data rates are: 1, 2, 5.5 and 11. All other data rates are 802.11g data rates.

Note: An access point or wireless router may be configured to exclude 802.11b data rates.

Override Destination Port: Leave blank to not use this feature. If a number (1 to 65535) is placed in this field,

the Utility will force the Destination Port to use this entered number. Use this feature to force the Destination Port to another value other than the default 6767.

Passwords

To improve security, you can require that a user log in to make changes to HMT140 parameters. If Passwords are enabled, a password prompt appears when a user clicks Update on the Setup tab. No other HMT140 functions will require a login password.

To set, change or remove an HMT140 password:
1   Open the HMT140 Utility.
2   Connect the HMT140 to your computer.
3   From the **Options** menu, select **Advanced Options**.
4   On the **Advanced Options** window, check **Enable use of passwords in HMT140**, then click **OK**.
5   To set the password for the first time:
   • Leave the **Current Password** field blank.
   • Check the **Change Password** option.
   • Enter the new password in the **New Password** and **New Password Again** fields.
   • Click **Update**.
6   To change an existing password:
   • Enter the current password
   • Check the **Change Password** option.
   • Enter the new password in the **New Password** and **New Password Again** fields.
   • Click **Update**.
7   To clear a password:
   • Enter the current password.
   • Check the **Change Password** option, and leave the **New Password** and **New Password Again** fields blank.
   • Click **Update**.
   CAUTION: Record the password in a safe location for safe-keeping; the HMT140 does not save the pass-

word. If the password is forgotten, contact Vaisala Technical Support.

Set Up a New Channel

On the **Network** tab, you can select a specific Channel to view, using the **Channel** field.

To select multiple Channels for the HMT140 to search when connecting to an access point or a wireless router, select **Auto Find.**

> **Note:** The Channel Auto Find feature defaults to search for Channels 1 through 11. These Channels are set in the HMT140 Utility's .INI file. See Additional Program Parameters on page 44 for more information.

For Wi-Fi 802.11b radio mode, do not set the Channel Auto Find search channels to more than 3 channels. This will have an effect on the HMT140's range and battery life.

For Wi-Fi 802.11g radio mode, the HMT140 can search all channels with minimal effect on battery life and range.

Find Additional Networks

To locate additional networks:

1   On the **Setup** tab, on the **Network** page, click the **Find Networks** button to scan for all available wireless networks. The HMT140 Utility displays details about the currently available networks:
SSID: SSID of the access point or router (wireless channel).

MAC: MAC address of the access point or router.

Channel: Channel of the access point or router.

Security: Security setting of the access point or router. Note that some security settings will not work with the HMT140.

RSSI: Current signal strength.
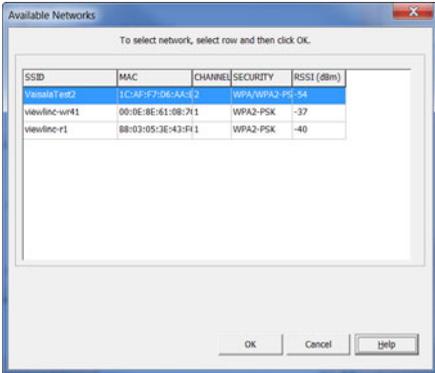
2   To select a network, click on the row in the **Available Networks** window, then click **OK**. The HMT140 Utility automatically places the network settings information in the appropriate fields in the **Setup** tab.

Note: During the Find Networks operation, the HMT140 is disconnected from the current network. To reconnect, either click **Update** on the **Setup** tab or click **Restart** on the **Status** tab.

Test Network Connectivity

Ping from Sensor

When the **Ping From Sensor** button is clicked, the HMT140 will use either the IP address in the IP Address field or the current address in the Destination IP field in the Setup tab and ping that specified address. Once the ping operation is complete, the utility will either indicated failed or success and specify the IP address in the Result field.

Ping from This PC

When the **Ping From This PC** button is clicked, the HMT140 will use either the IP address in the IP Address field or the current address in the Destination IP field in the Setup tab and ping that specified address from the local PC. Once the ping operation is complete, the utility will either indicated failed or success and specify the IP address in the Result field.

Contact Destination Host

The HMT140 Utility will instruct the HMT140 to send a transmission (data packet) to the Destination Address. If the Destination responds with an acknowledgement, the Utility will indicate success, otherwise the Utility will display "Failed" in the Result field. Use the Contact Destination Host function to confirm that the HMT140 is sending packets to the Destination.

Note: The Destination must be capable of responding with an acknowledgement for this function to work.

Additional Program Parameters

The HMT140 Utility stores all program information in an INI text file, HMT140Utility.INI. You can use this file for reference, and, if you are updating several HMT140 loggers, save time by making edits to the file directly.

To modify the HMT140Utility.INI file:

1   Go to the **Help** menu, select **Utility Folder Paths**, and then select **Explore Setup**.

2   Double-click the file, **HMT140Utility.INI**. It will open in a text editor.

3   To set the maximum number of tries (updates the Tries field, default maximum is 5):
```
[Settings]
MaxNumTries=5
```

4   To modify the default UDP port (default is 6767):
```
[Settings]
DefaultPort=6767
```

5   To specify the auto find channels:
```
[Settings]
ChannelMask=1,2,3,4,5,6,7,8,9,10,11
```

6   Restart the HMT140 Utility to apply the changes.

CHAPTER 5
MAINTENANCE

This chapter provides information to help you provide basic in-house maintenance of the HMT140, including:

- Instructions for replacing the HUMICAP® RH sensor
- Instructions for removing and fastening probes
- Calibration and adjustment information
- Battery replacement instructions

Replacing the HUMICAP® RH Sensor

To ensure maximum operating life and a fast sensor response time, replace a dirty filter.

Note: Do not attempt to clean the filter.

When replacing a dirty filter, the HMP110D requires re-calibration. Refer to the HMP60 and HMP110D Series User's Guide for complete instructions.

Removing and Fastening the Probe

Fixed Probe Model

To remove and replace a fixed probe:

1   Loosen the metal locking bushing by carefully turning it counter clockwise.
2   Remove the probe from the HMT140 by pulling it gently outwards.
3   Attach the new probe to the 4-pin M8 panel connector on the HMT140 (only one position possible).
4   Tighten the locking bushing to the M8 panel connector by turning it clockwise.
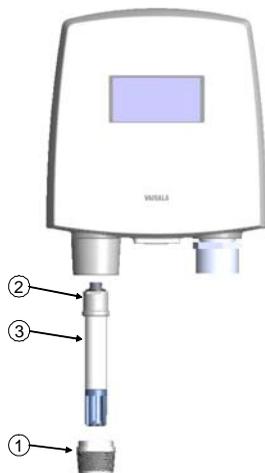
Figure 16: Fixed Probe Model

The following numbers refer to Figure 16:

1 Locking bushing

2 Holder bushing (attached permanently to the probe)

3 HMP110D probe

Remote Probe Model

To remove and replace a remote probe:

1 Unscrew the small sleeve at the end of the probe cable that secures the probe in place, and pull out the probe.

2 Replace the probe and screw the small sleeve back on, securing the probe tightly in place.
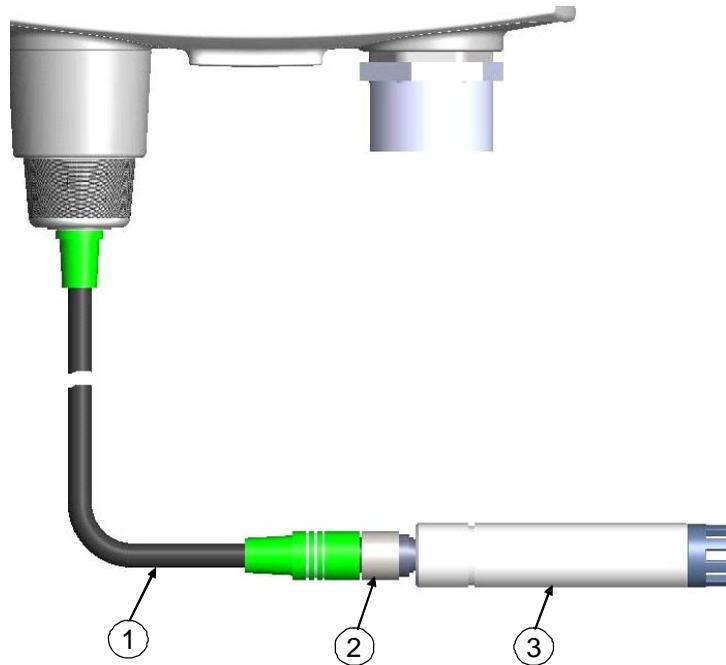
Figure 17: Remote Probe Model

The following numbers refer to Figure 17

1 Probe cable

2 Sleeve securing the probe to the cable

3 HMP110D probe

Calibration and Adjustment

HMT140 parameters are calibrated and adjusted using viewLinc.

To view calibration status:

‣ On the **Info** tab, click **Get**. This page will display calibration information including calibration date, calibrator, and next calibration due date.

Please refer to the Vaisala Veriteq viewLinc User's guide for further information, or visit www.vaisala.com.

For calibration of HMP110D probes, refer to the supporting documentation available on the Vaisala website.

Battery Replacement

To replace the batteries and reset the battery meter of the HMT140:

1 Open the HMT140 case. Use your thumb to press and hold the release tab, located between the two glands, then pull the cover out and up with your fingers. See HMT140 Components Diagram on page 19 for location of release tab.

2 Turn the power switch off.

3 Remove the batteries by pulling them up firmly. If the battery does not come out easily, gently pull back on one of the battery holder tabs first.

Note: Use only Vaisala supplied batteries, part #: 236318SP Vaisala 3.6V Lithium Thionyl Chloride batteries.

4 After replacing the batteries, press and hold the SERVICE button and turn the power switch on. The LED light will flash and the HMT140 will beep eight times.

5 Release the SERVICE button. At this point, the battery meter is also reset.

CAUTION: Remove batteries before shipping

APPENDIX

SPECIFICATIONS AND TROUBLESHOOTING

Specifications

Table 1: Humicap Relative Humidity Measurement Specifications (with HMP110D)

Property	Description/Value
Measurement range	0 ... 100% RH
Accuracy (including non-linearity, hysteresis, and repeatability): at 0 ... +40 °C (+32 ... +104 °F) at -40 ... 0 °C and +40 ... +80 °C (-40 ... +32 °F and 104 ... +176 °F)	±1.7 %RH (0 ...90 %RH) ±2.5 %RH (90 ... 100 %RH) ±3.0 %RH (0 ...90 %RH) ±4.0 %RH (90 ... 100 %RH)
Factory calibration uncertainty at 20 °C (+68 °F)	±1.5 %RH
Humidity sensor	HUMICAP 180R
Stability	±2 %RH over 2 years

Table 2: Humicap Temperature Measurement Specifications (with HMP110D)

Property	Description / Value
Measurement range	-40 ... +80 °C (-40 ... +176 °F)
Accuracy over temperature range: at +15 ... +25 °C (+59 ... +77 °F)	±0.2 °C (±0.36 °F)
at 0 ... +15 °C and +25 ... +40 °C (+32 ... +59 °F and 77 ... +104 °F)	±0.25 °C (±0.45 °F)

Table 2: Humicap Temperature Measurement Specifications (with HMP110D)

Property	Description / Value
Accuracy over temperature range continued: at -40 ... 0 °C and +40 ... +80 °C (-40 ... +32 °F and +104 ... +176 °F)	±0.4 °C (±0.72 °F)
Temperature sensor	Pt1000 RTD 1/3 Class B IEC 751

Table 3: Analog Inputs

Property	Description / Value
Current inputs	0-22 mA Resolution: 0.67 µA Accuracy: ±0.15 % F.S. at +25 °C Input Impedance: 62 Ohms Overload Protection: 40 mA max.
Voltage inputs	0-5 V, 0-10 V Resolution: 0.0034% F.S. Accuracy: ±0.15 % F.S. at +25 Input Impedance: 37K Ohms Overload Protection: 50 volts max.
Boolean Contact inputs	Open/Closed with magnetic reed switch cable connections (Dry Contact)
Isolation	One common per logger
RTD inputs	Pt 100 RTD / 4 wire Class A IEC 751 Input Impedance: 5.1K Ohms
RTD Measurement range	-196 °C to +90 °C
RTD Accuracy over temperature range	-196 to -90 +/- 2.5 °C -90 to -30 +/- 0.75 °C -30 to 0 +/- 0.5 °C 0 to 50 +/- 0.25 °C 50 to 90 +/- 0.75 °C

Table 4: Humicap Operating Environment Specifications

Property	Description / Value

Operating temperature range
  HMT140 device body, no display
  HMT140 device body, with display
  HMP110D probe
	
	-40 ... +60 °C (-40 ... +140 °F)
	-20 ... +60 °C (-4 ... +140 °F)
	-40 ... +80 °C (-40 ... +176 °F)

Storage temperature range	-50 ...+70 °C (-58 ...+158 °F)
Electomagnetic compatibility	EN 61326-1:2006 Electrical equipment for measurement, control and laboratory use - EMC requirements - Basic immunity test requirements EN 55022:2006 + Am 1:2007 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement. Class B.

HMT140 Dimensions (Fixed Probe)
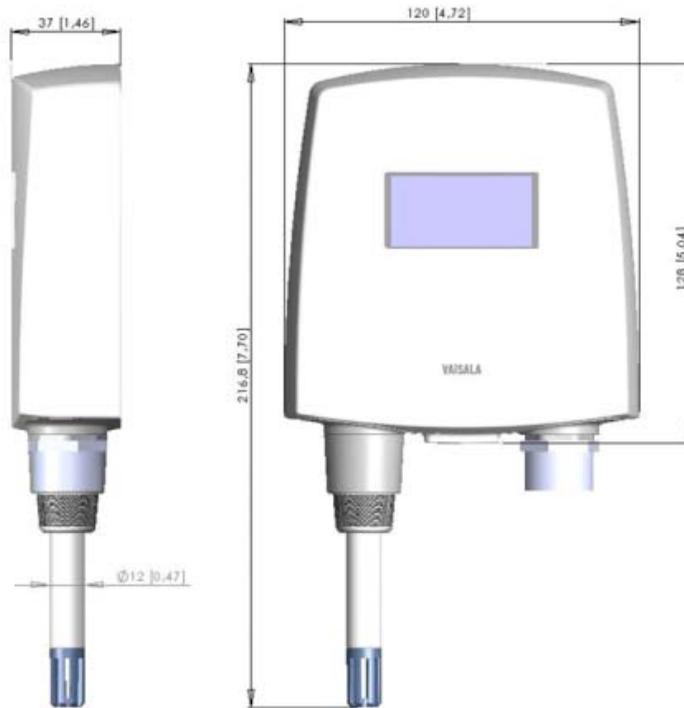
HMT140 Dimensions (Remote Probe)

37 [1,46]

120 [4,72]

157,95 [5,39]

128 [5,04]

71 [2,8]

Ø12 [0,47]
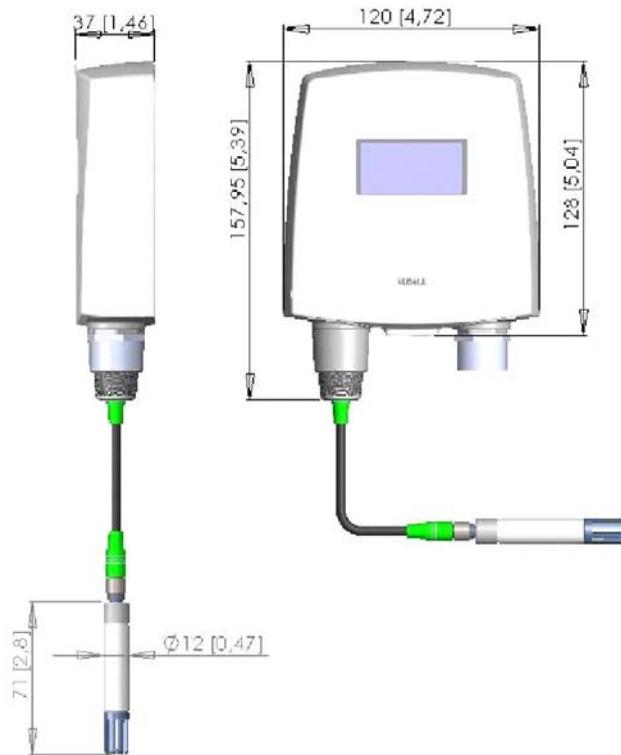
Table 5: Mechanics Specifications

Property	Description / Value

Operating Temperature Range
   HMT140 device body, no display
   HMT140 device body, with display
	
	-40 C ... +60 °C
	-20 C ... +60 °C

Material
   HMT140 device housing
   display window
   Probe body
   Probe grid filter
	
	PBT plastic
	PC plastic
	Stainless steel (AISI 316)
	Chrome coated ABS plastic

Housing classification	IP65 (NEMA 4)

Connections
   Screw terminals
   HMP110D Probe interface
	
	26 AWG ... 20 AWG
	4-pin M8 female panel connector

HMP110D Probe cable lengths	3 m, 5 m, cables can be cascaded up to maximum of 10 m

RTD Temperature Sensor
   Sensor tip material
   Sensor tip length
   Sensor tip diameter
   Cable length
	
	Stainless steel (AISI 316)
	50.8 mm
	4.76 mm
	5 m

Hermetic Door Switch Sensor Cable length	 7.6 m
Display (optional)	128 x 64 resolution full graphics B&W display without backlight
Weight (Wall model, including probe)	300g

Table 6: Wireless Specifications

Property	Description / Value
Networking Standards	IEEE 802.11 b/g
Frequency Band	2402 ~ 2480MHz

Table 6: Wireless Specifications

Property	Description / Value
Modulation	802.11b compatibility: DSSS(CCK-11, CCK-5.5, DQPSK-2, DBPSK-1) 802.11g:OFDM (default)
Channel intervals	5MHz
Channels	1-14
Wi-Fi Security	WEP (128-bit), WPA, WPA2 (Personal)
Output Power	+18dBm (63mW)
Receiver Sensitivity	-85dBm (63mW)
Antenna	Onboard Whip
Data Rates	802.11b: 1,2,5.5,11 Mbps 802.11g: 6,9,12,18,24,36,48,54 Mbps
Certifications	FCC: U30-G2M5477 (FCC Part 15 Sub-part B:2008 Class B, FCC CRF Title 47 Part 15 Subpart C). IC: 8169A-G2M5477 (IC RSS-210). CE: EU ID# 0681 (ETSI EN301 489-1 V1.8.1, 489-17 V2.1.1, ETSI EN300 328 V1.7.1, EN55022 Class B, ENG1000 4-2, 4-3, 4-6, 4-8, EN60950-1:2001+A11:2004) Wi-Fi Certified: WFA7649 FCC 47 CFR Part 15-2011 Subpart B IC ICES-003:2004, EN61326-1:2006 EN61326-2-3:2006 EN61000-3-2:2006+A1:2009+A2:2009 EN61000-3-3:2008 EN61326-1:2006 MIC R 201-125765 CMIIT ID: 2013DJ7129

Table 7: External Power Supply Options

Property	Description/ Value
External source	9V DC to 28V DC
Current rating	1.7A to /.5A DC
Power	15 Watt

Troubleshooting

Use HMT140 Utility to help troubleshoot issues that may occur while connecting the HMT140 to a wireless network.

HMT140 Operation Mode

When the Configuration Cable is connected to the HMT140, it enters Config mode. In this mode, the HMT140 continuously attempts to connect to the wireless network and stays connected until the Configuration Cable is disconnected or the setup has changed.

The HMT140 is in Transmitter mode when the Configuration Cable is not connected, and the HMT140 power switch is turned on. When in Transmitter mode, the HMT140 remains in a low power state, but will turn on, connect, transmit a UDP packet, and then go back to the low power state when it is ready to transmit.

Signal Strength

The HMT140 works best with signal strengths above -63 dbm (for 802.11b mode) and -75dbm (for 802.11g mode). If the signal strength is less, the HMT140 may work marginally or not at all. Stronger signal strength improves transmission performance.

Since the signal strength will vary from sample to sample, you should take multiple samples to determine the signal strength. View signal strength on the Status tab and in the Available Networks window (click the **Find Networks** button on the **Setup** tab).

Indicator Lights

The red LED on the main board (Center, or below LCD) indicates that a transmit attempt has just started. The LED on the radio module indicates that radio module is connected to the network. When in Transmitter mode the LED will flash when a connection is made. When in Config mode (the programming cable is connected to the HMT140) the LED will remain on continuously when a connection is established.

Access Points

Some access points have a mode called Auto Channel mode where it will move between up to 11 channels. If the access point is using this feature the HMT140 may work properly in Config mode, but could fail or work very marginally in Transmitter mode. If the access point is using Auto Channel mode, make sure the HMT140 has "Auto Find" for the channel and the right channels have been selected for "Auto Find" channels.

Some access points will move between three channels (typically 1, 6 and 11). The HMT140 Utility will work with these access points with the Channel AutoFind feature but the channels that are used must match the channels the HMT140 is configured for.

Transmitter Cycle

In Transmitter mode, it can take up to five seconds for the transmit cycle to complete. Transmit time is calculated from when the SERVICE button is pressed to when the acknowledgement is received from the host.

Is the connect time too long?

If the connect time to the network is consistently long (over five seconds), the HMT140 may not be able to connect to the network. If you suspect the connect time to the network is long:

1   Use the Test Connect Time tool (see Determining Connection Problems on page 38), or,
2   Use a PC to connect to the network and then measure the time it takes to connect.

3   If the network consistently takes longer than five seconds to connect, you may need to adjust the settings:

- Set the connect time window to a longer value (use the Connect Time tool to help determine this value) or,

- Change a connection component like channel AutoFind or DHCP.

     Note: Extending the connect time may decrease battery life. The battery meter may need to be reconfigured (contact Vaisala Technical Support).

Cannot connect to the wireless network

1   Verify that the network exists.

2   Verify signal strength. Use the built-in signal strength meter. Determine if adequate signal strength exists at that location.

3   Verify your network settings.

4   Make sure the router or Access Point accepts connections of 1 Mbps. Some access points may be set up to exclude certain WLAN data rates. You may have to change the WLAN data rate setting in the HMT140.

5   If the HMT140 was previously connected at one location, but will not connect at the new location, temporarily move it to the previous location and verify operation. It is also possible that a setting on the network has changed.

Can connect to the network, but cannot obtain a dynamic IP address

1   Verify your network settings.

2   Verify that you are connected to the right network.

3   Use the **Ping from Sensor** function in the HMT140 Utility to ping an address that should be available from the network (verify that the address is ping-able).

4   Use the **Ping from PC** function in the HMT140 Utility to see if your PC can ping an address on that network (your PC must be connected to that network).

5   Use the **Ping from PC** function in the HMT140 Utility (if this PC is connected) and see if you can ping the HMT140 when it is in Config mode. Go to the Status tab to determine the IP address.

6   Use a static IP address temporarily and connect to the network to determine if HMT140 transmissions are being received by the host.

7   Make sure the DHCP Server has not exhausted the number of assignable IP addresses.

8   Check if the DHCP Server needs to be configured to accept this type of device (it is possible the DHCP Server is taking too long to respond to the request).

Can connect to the network, but host is not receiving UDP packets

1   Verify your network settings.

2   Verify that you are connected to the right network.

3   Verify that the Destination IP address is correct.

4   If using the broadcast address, verify that the network can support broadcasts. Most routers by default will not route broadcast traffic.

5   If the host will respond to ping requests, use the **Ping from Sensor** function in the Utility to have the HMT140 ping the host. **Use the Ping from PC** feature if this PC is connected or a PC on the network and ping the host. Also try pinging the HMT140 when it is in Config mode.

6   Check the following:

•   Is the host is ready to receive the transmit packets?

•   Is the host configured to listen for the UDP packets?

•   Is the host software running?

•   Is firewall software installed at the host that would prevent the UDP traffic?

•   Is there anything on the network that would restrict packets from being routed (like MAC filtering)?

7   Perform a destination test (use the **Contact Destination Host** function from the **Tools** tab).

8   If using a hostname for the destination address:

a   Make sure the DNS address is correct (whether set as static or obtained through the DHCP server).

9   Check if the hostname is being resolved in Config mode (go to the HMT140 Utility Status tab and examine the Resolved Destination field).

Can connect to the network and Contact Destination using the utility, but host is not receiving UDP packets in Transmitter mode.

1   Verify your network settings.

2   Check if the access point using Auto Channel mode is switching between channels. The access point may have switched to a different channel than is set up in the HMT140.

3   Use the Connect Time tool in the utility to verify how long the HMT140 takes to connect to the network.

    • If the network consistently takes longer than five seconds to connect to the network, you may need to make adjustments to the settings. Set the connect time window to a longer value (use the Connect Time tool to help determine this value) or change a connection component like channel AutoFind or DHCP.

    Note: Extending the Connect Window may cause the battery to be exhausted more quickly. The battery meter may need to be de-rated.

4   Verify the signal strength where the HMT140 is located. Also check how the HMT140 is mounted and oriented at this location with respect to the access point. For example, the HMT140 is mounted at the back of a refrigerator but may work better being mounted near the top of the refrigerator.

5   Change batteries.

Battery Meter indicates a lower battery life than expected

1   Confirm whether the battery meter was reset when the batteries were last changed. (See Battery Usage on page 37.)

2   Set a longer transmit period.

3   Check the HMT140. Was the SERVICE button pressed frequently?

4   Check alarm history. Were there a large number of alarms initiating more frequent transmission attempts?

5   Check transmission attempts. Is the setting for number of tries too high?

6   Check network quality. Is the connect time for the HMT140 greater than five seconds? Use the "Test Connect Time" tool in the HMT140 Utility.

7   Check the signal strength.

HMT140 Utility cannot find the HMT140

1   Make sure the HMT140 Configuration Cable is connected to the HMT140.

2   Disconnect the cable, power the HMT140 off, power back on, wait 5 seconds, connect the cable and try again.
    • Does the red LED in the programming cable flash when doing an operation?

3   Disconnect the cable from the HMT140 and connect again.

4   Disconnect the cable from the HMT140 and then disconnect the cable from the PC. Wait 30 seconds. Insert cable back into PC and into the HMT140.

5   Reboot your computer.

6   Use an externally powered USB Hub. Your computer may not be supplying enough power through the USB port.

HMT140 Utility Network Compatibility Issue - Data Is Not Reaching Destination In Transmitter mode

While in Config mode, the HMT140 can connect (associate/ authenticate) to the network and Contact Destination is successful but while in Transmitter mode, the data never reaches the destination. The UDP data packet from the HMT140 is not forwarded by the router.

The following routers have been confirmed to have this problem:

• Linksys WRT610N

• Linksys WRT310N V2

• Belkin F5D7234-4BC V1

• NetGear WNDR3400

Workaround:

1 Use Dynamic IP and have DCHP Caching turned off. If the IP address is static or the DHCP Caching is enabled, these routers will not forward the HMT140's UDP data packet.

2 Replace the router (contact Vaisala Technical Support).

Index

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